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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/973,762

Filing Date: October 11, 2001

Appellant(s): SHIMURA ET AL.

Roland E. Long, Jr.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/30/2005 appealing from the Office action mailed 6/8/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,731,706	Koeman et al	03-1998
2002/0041565	Valenti et al	04-2002
6,055,297	Terry	04-2000

"A Spectrum Analyzer for the Radio Amateur", by Wess Hayward, and Terry Whit, pages 35-43.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-8, 11-12, 14 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koeman et al (5,731,706 hereinafter Koeman) in view of Valenti et al (US 2002/0041565 Valenti et al hereinafter Valenti).

Regarding claims 1, 3 and 17. Koeman teaches a system for measuring cross-talk (Title, abstract) comprising:

polling means included in an outside line of an xDSL circuit installed in an office for pulling a subscriber line (see switch matrix 200 figures 5-6);

noise level measuring means for measuring a level of cross-talk noise on the subscriber line (see receiver 208 and 218 in figures 5-6); and

decision means for determining, based on the level of cross-talk noise measured, whether or not the subscriber line is usable (see microprocessor 212 figures 5-6 wherein signals are provided to the microprocessor allowing the microprocessor to determine whether or not the subscriber line is usable or not by comparing the values to a look-up table---see 54 figures 5-6).

According to Applicant's newly added claim language and arguments, Koeman fails to teach wherein the measured cross-talk noise characteristic is cross-talk **existing** on the subscriber telephone line due to interference from other subscriber telephone lines. Instead, Koeman only focuses on home network line pairs having frequency in range beyond the newly recited range appearing in Applicant's amended claim language (see Amendment "C", paper number 13, dated 6/14/2004 and argument appearing on the last three lines of page 11). In other words, Koeman only focuses on home network lines having frequency range above xDSL services (i.e. between 25 kHz to 1.1 MHZ).

The reason for Koeman not considering xDSL frequency range is that Koeman tester is to be used during **installation phase** enabling installers the ability to verify proper transmission performance (see BACKGROUND of Koeman) of wire pairs.

Modifying Koeman tester to include testing for cross-talk after installation phase (i.e. in-service and/or existing) would only add flexibility to the tester as taught by Koeman.

Valenti provides the hardy needed tester (paragraphs 0034 to 0036) wherein volt meter (last two lines of paragraph 0046) is used to determine if crosstalk exists on bundled telephone cable (abstract, paragraphs 0046-0050). Valenti indeed characterizes crosstalk on a loop-by-loop basis enabling for a much more granular crosstalk characterization of plant (paragraphs 0010-0011) by focusing on limited frequencies (i.e. ISDN and ADSL) having unique crosstalk power spectral density (see figure 11 and paragraph 0036). Valenti also uses the terms "NEXT" and "FEXT" to classify the two types of crosstalk (paragraphs 0041-0041). Valenti even identifies services that are generating crosstalk on a pair that may not even be carrying DSL services (see middle of paragraph 0046). Valenti also uses measures crosstalk noise of subscriber line only within an xDSL transmission frequency band (see figures 5-7) including SDSL (see Table 2 page 5) to properly identify disturbers (paragraphs 0052-0054). Valenti is capable of identifying mixed crosstalk when at least two different services are present in a binder (paragraph 0055).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify the tester as taught by Koeman to use limited frequencies as taught by Valenti for the benefit of testing for crosstalk after installing

new bundles of cable thereby creating a more flexible tester that may be used not only during installation but a tester that may be used after installation as well.

Regarding Claim 2. Valenti teaches the measurement of crosstalk is made without injecting a test tone onto the subscriber telephone line (see figure 2 wherein voltage measurement of TIP an RING used) only within a frequency band up to 1.1 MHZ (paragraphs 0036, 0041 and 0050, see frequencies listed in figures 4-10).

Regarding claim 4. Koeman discloses using a switch matrix 200 figures 5-6 for selecting a set of wire pairs 1-4 to be tested.

Regarding claims 5 and 7. Koeman teaches wherein the noise level measuring means comprises:

a voltage measuring circuit for measuring cross-talk noise voltage input via relays (see figures 5-6 wherein a signal source 202 produces stimulus signal input via relay matrix 200 and measuring circuit (i.e. RECEIVER) receives response signal and converts the response signal to a digital signal 208 and transforms the digital signal to noise spectrum by using FFT processor 210); and

an ADC circuit ... (see figures 5-6 wherein a signal source 202 produces stimulus signal input via relay matrix 200 and measuring circuit (i.e. RECEIVER) receives response signal and converts the response signal to a digital signal 208 and transforms the digital signal to noise spectrum by using FFT processor 210); and

an FFT circuit ... (see figures 5-6 wherein a signal source 202 produces stimulus signal input via relay matrix 200 and measuring circuit (i.e. RECEIVER) receives

response signal and converts the response signal to a digital signal 208 and transforms the digital signal to noise spectrum by using FFT processor 210).

Regarding claims 6 and 8. Koeman teaches wherein the decision means comprises means for comparing the noise spectrum data with a template for noise level decision to thereby determining whether or not the subscriber line is usable (see figures 5-6 wherein a look-up table (i.e. template) is used for comparing the FFT signal (i.e. noise spectrum) to values stored in look-up table 54). Valenti also teaches xDSL frequency range (paragraphs 0036, 0041 and 0050, see frequencies listed in figures 4-10).

Regarding claims 11-12, 14 and 20. Valenti teaches noise levels of existing xDSL services operating in xDSL frequency ranges (paragraphs 0036, 0041 and 0050, see frequencies listed in figures 4-10).

Regarding claim 18. Valenti teaches ISDN signal (paragraphs 0036, 0041 and 0050, see frequencies listed in figures 4-10).

Regarding claim 19. Valenti teaches a second xDSL channel (paragraph 0055).

(10) Response to Argument

(I) Appellant argues that neither Koeman nor Valenti measuring cross talk only within the xDSL transmission frequency band (see arguments starting on page 8 and continuing to page 9).

The Examiner notes that Appellant fail to point to specification or argue what is meant by only within the xDSL frequency band. Instead, Appellant's figure 1 generally list a range from 0 – 1 MHz. Koeman also list a range from 0.1 MHz to 155

MHz which translates to a range of 100 kHz to 155 MHz (see col. 2 lines 64-65). The Examiner notes that Valenti figure 4 clearly shows frequencies only within the xDSL frequency band (i.e. 0.01 to 1.1 MHz)

(II) Appellant argues (see last line on page 9 continuing to page 10) that the Examiner has stated that "The reason for Koeman not considering xDSL frequency range is that Koeman tester is to be used during installation phase enabling installers the ability to verify proper transmission performance ... of wire pairs."

The Examiner notes that this statement was in response to Appellants previous argument that Koeman is not concerned about existing cross talk (i.e. real time) because Koeman test before installation of the service. The Examiner was not conceding that Koeman teaches outside the xDSL frequency range. Instead, the Examiner was acknowledging Appellants arguments that Koeman only test for cross-talk during installation phase.

(III) Appellant argues that there is no motivation to combine Koeman with Valenti (see second to last paragraph on page 10 continuing to page 11).

The Examiner has already provided motivation (see Rejection listed directly above). Furthermore, Valenti teaches a tester wherein volt meter is used to determine if crosstalk exist on bundled telephone cable (see at least last two lines of paragraph 0046 wherein a spectrum analyzer or a selective volt meter used). Realizing this and the fact that provisional application 60/222,734 reveals the same voltmeter being used. For example, 60/222,734 page 1, first paragraph and page 3, last five lines state that it is therefore an object of the present invention to overcome the deficiencies evident in

the prior art in order to be able to take measurements in the DSL band and perform calculations so that prediction and/or identification of crosstalk between pairs within a cable can be performed. Provisional Application 60/222,734 page 4, second full paragraph reveals that measurements and crosstalk source identification are performed by the invention with automated algorithms wherein the crosstalk data is collected and used by a spectrum management system to enable more efficient spectrum management and page 5, second to last paragraph reveals a new "broadband test head" can be installed in the office to automatically and routinely provide current information on loop make-ups and crosstalk and page 8, second full paragraph even account for individual types of crosstalk sources or crosstalk couplings related to particular pair in a cable, thus a system can characterize crosstalk on a loop-by-loop basis has a potential to yield a much more **granular crosstalk characterization of the plant**. Provisional Application 60/222,734 even teaches measuring NEXT from an upstream ADSL (i.e. within xDSL frequency band) source for a number of pair-to-pair combinations. These NEXT PSDs are correlated with the PSD crosstalk templates of some known sources (see Provisional 60/222,734 starting on the last two lines of page 8 and continuing to page 9). Provisional Application 60/222,734 (see last three lines on page 10 continuing to page 11) teach the ability to identify the source of a disturber from a cross-talk measurement. The system measures the cross-talk on a cable pair and from that measurement identifies the source of the cross-talk. Once the source is identified the information may be used to populate a database that can be used for spectrum management. The invention measures the crosstalk on an individual

basis and the types and numbers of crosstalkers in a cable or in an individual cable binder, can be measured, recorded, and tracked (Provisional Application

60/222,734---last paragraph page 11) allowing more customers to be served.

Provisional Application 60/222,734 pages 12-14 reveal a broadband test head used to access loop through metallic test and directly measure received crosstalk.

Provisional Application 60/222,734 even discloses that a DSL modem may itself measure crosstalk (page 13). More importantly Provisional Application 60/222,734 discloses that the invention could be used for any types of transmission systems operating on multi-pair metallic cables that are not specifically called DSLs. The invention could be applied to campus networks or private LANs linked by twisted pairs (page 15).

The Examiner notes that Appellant's have already admitted that Koeman polls a LAN circuit (see paper dated June 14, 2004 page 12, first three lines). Therefore, Provisional Application 60/222,734 also supports Examiners motivational statement of modifying Koeman tester to include testing for cross-talk after installation phase (i.e. in-service and/or existing) would only add flexibility to the tester as taught by Koeman and already disclosed by Provisional Application 60/222,734.

(IV) Appellant argue (see second paragraph on page 12 continuing to page 14) that Valenti provisional application 60/222,734 does not disclose any voltmeter.

The Examiner disagrees. Valenti provisional application teaches (see at least page 13) a spectrum analyzer used to display DSL power spectral densities (i.e. PSD) to classify crosstalk. One of ordinary skill in the art would readily recognize PSD is

normally displayed as Voltage verses frequency. In other words, even though Valenti does not use the term "voltmeter" in provisional application 60/222,734 does not mean that the spectrum analyzer can not display Voltage verses frequency. In fact, one of ordinary skill in the art would recognize that cross talk is classified by using power spectral densities measured in milliwatts per Hertz expressed in decibels, or dBm/Hz.

The Examiner notes that the following reference was not previously used but teaches well known PSD used in conjunction with crosstalk. U.S. patent 6,055,297 (Terry) discloses that it is well known to estimate crosstalk by using power spectral density (PSD), measured in milliwatts per Hz (see column 1 lines 62-68).

The Examiner notes that the following document was not previously used for rejecting Appellants claims but was provided to Appellant in the Examiner's Advisory action dated 9/19/2005 for support of well known Spectrum Analyzer data. The Examiner has already pointed out to Appellant in the Examiner's Advisory action dated 9/19/2005 that Spectrum Analyzer's are very common in the industry and are used to provide output voltage verses dBm (please see "A Spectrum Analyzer for the Radio Amateur", by Wess Hayward, and Terry Whit, pages 35-43 especially figure 4 on page 38 and the center column on page 38).

(V) Appellant argues that Valenti provisional reference 60/222,734 uses time domain reflections of special pulses sent out on the loops and from this voltage measurement is not being used (see middle paragraph on page 14).

The Examiner disagrees. Valenti provisional application 60/222,734 starting at the second to last line on page 12 and continuing to the top of page 13 reveals direct

measurement of received crosstalk disclosed. Next, the Examiner directs Applicants attention to page 13 (lines 1-2) wherein an alternative may be used: "The BBTH could excite a pair with a signal and measure the received signal on another pair to measure the crosstalk coupling". The Examiner notes that it is not a requirement in '734 to first excite twisted pair before a measurement is taken. Therefore, the Examiner's rejection made Final, dated 6/8/05 still applies. In other words, Valenti (Pub. No.: 2002/0041565) paragraphs 0034 – 0036 and the last two lines of paragraph 0046) clearly disclose that spectrum analyzer or a voltage meter (a.k.a. voltmeter) can be used.

(VI) Appellant argues that the Examiner has not made the case for modifying Koeman to not include a injected pulse signal and therefore has not presented a prima facia case of obviousness for rejecting dependent claim 2 (see pages 15-17).

The Examiner notes that Koeman uses an injected pulse because there is no service on the lines yet. Appellants have already conceded to this fact (see last three lines of section III listed above). Valenti allows for crosstalk to be measured without injecting a test tone (see Examiner rejection listed above wherein Valenti paragraphs 0036, 0041 and 0050 are listed). The Examiner also notes that Valenti provisional application 60/222,734 supports paragraphs 0036, 0041 and 0050. Examiners motivational statement of modifying Koeman tester to include testing for cross-talk after installation phase (i.e. in-service and/or existing) would only add flexibility to the tester as taught by Koeman and already disclosed by Provisional Application 60/222,734.

(VII) Appellants start repeating arguments that Koeman in view of Valenti fail to teach voltmeter (see pages 17-18).

The Examiner disagrees (please see Examiner's rejection listed above and sections III and IV listed above).

For the above reasons, it is believed that the rejections should be sustained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Respectfully submitted,



Barry Taylor

Patent Examiner

March 13, 2006

Conferees:



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